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ABSTRACT

Prepared for cooperative education placement and career service professionals, this paper considers the applications of microcomputers in the development of a comprehensive management information system (MIS) for cooperative education programs. After noting the complicated information needs of cooperative education and common weaknesses of current data collection and utilization methods, the paper outlines several steps in the development of a comprehensive MIS: (1) clearly articulating external expectations and program objectives; (2) specifying information needs; (3) identifying data for collection; and (4) establishing a systematic approach to data collection, storage, and manipulation. The applications of microcomputers in the implementation of the system are then considered. Software and hardware selection are discussed in terms of available resources and information needs, the educational applicability of the computing component, the integration of the microcomputer with the institution's mainframe computer; and the simplicity and efficiency of the equipment. After examining the advantages of using microcomputers in cooperative education (e.g., the availability of well-developed programs for file creation and word processing and increased storage capacity and speed of information retrieval), the disadvantages are discussed (e.g., potential difficulties in loading information from the mainframe and software problems). (LL)

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MICROCOMPUTERS IN THE MANAGEMENT OF COOPERATIVE EDUCATION PLACEMENT AND CAREER SERVICES: DEVELOPING A MANAGEMENT INFORMATION SYSTEM IN CAREER CENTERS

BY: JAMES W. VARTY

PRESENTED AT THE ANNUAL CONVENTION OF THE AMERICAN ASSOCIATION OF COMMUNITY AND JUNIOR COLLEGES, APRIL 26, 1983, NEW ORLEANS, LA.

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Forum Presentation #76 The American Association of Junior and Community Colleges

Microcomputers in the Management of Cooperative Education

Placement and Career Services: Developing a Management Information System in Career Centers

Tuesday, April 26, 2:00-3:15 PM

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Introduction:

Cooperative Education, Placement and Career Services present many unique and rather complicated information management and word processing needs in relation to other educational strategies. To function effectively, indeed, at times, to survive requires efficient management of information. The increasing sophistication and friendliness of microcomputing presents some interesting possibilities and opportunities for cooperative and career placement professionals to develop effective management and information processing systems. Yet computers are only a tool and their contribution to information management and processing will be only as effective as the information system they implement.

In the next few minutes I would like [illegible]) emphasize the need for careful development of information systems, 2) suggest steps to be taken in that process and 3) then to make some specific remarks about the use of microcomputing in such a

system. There will be time for audience discussion. The order in this presentation is deliberate because information system design should determine the type of software and hardware purchased. Indeed, information management and word processing systems are essential whether or not individual programs select an automated or manual approach to the storage and processing of data.

Much of what I will be saying is already contained in a monograph recently published by the National Commission for Cooperative Education entitled "Developing a Comprehensive Cooperative Education Program: Management Information Systems", Varty and Thompson, and a workbook, "Developing a Management Information System for Cooperative Education", Varty and Thompson, available from Macomb Community College, in Warren, Michigan. Though what I will say will have specific applications to cooperative education, the applications to placement, career services and related areas should be very clear. What will be proposed is a process for the development of a comprehensive system for the management and delivery (word and information processing) of information about various populations.

First a few definitions are in order. What is a management information system? For our purposes I would define it as a system that provides the necessary information at the proper time and place to enable the effective management of all facets of an organization. What does word processing add to such a system? Again, for our purposes, word processing adds the ability to create, store, produce, and generate routine and unique

correspondence in a very professional and efficient manner. It may range from the simple storage of mailing lists and routine correspondence, to resume development, to management calendars, and even to electronic mail and information communication.

Cooperative Education: A Complicated Strategy

I have mentioned that cooperative education is a relatively complicated strategy. Perhaps it would be well to take a minute to explain why this is so.

The cooperative education experience develops from and depends upon clear, accurate, and frequent communication among the parties involved: employers, educators, and students. To be in a position to respond to employer requests, directors of cooperative education take the pulse of the business community constantly. At the same time, because co-op is a relatively new option in many colleges and universities and because it frequently depends upon state and federal funding, it certainly receives its share of scrutiny. Directors respond to information requests from central administration and governmental agencies and are required to develop thorough rationales at budget building time. Finally, because cooperative education is optional at most institutions, continous and effective marketing and communication of cooperative education to students is essential if cooperative education is to be effective.

The complex task of placing qualified students with various employers in positions appropriate to individual abilities and aspirations demands comprehensive information about students as well

as a clear description of available employer positions. The management of information required for the matching process is relatively easy for the coordinator with a few students and a limited number of placements. It becomes much more difficult as coordinator load increases in a maturing program. Once students are placed, the determination of individual learning objectives and the consequent evaluation of whether learning has occurred add a further dimension to information management.

Common Weaknesses in Co-op Management Information Systems:

Nearly all cooperative education programs do collect some information about co-op students and do evaluate semester student performance. Many even undertake occasional evaluation of the long-range effect of the cooperative education experience on student development as well as the general effectiveness of the institution's approach to the cooperative effort. Few coordinators or directors of cooperative education, however, have ever spent time reviewing their information needs and developing a systematic approach to information management. As a result, certain weaknesses are common. Rather than collect too little data, some directors attempt to collect too much data. Application forms, for example, may require coordinators to provide facts that are not utilized or to collect the same items of data on various forms when they could better be collected less frequently. Often data collection occurs in such a manner that the ability to generate information is severely limited. For instance, coordinators might collect

wage and salary data from students on one form and employer data on another form. Consequently, they would find it difficult to combine the data items to generate an information report that reflects salaries paid to students by specific employers. Directors may develop and distribute a particular collection instrument without establishing responsibility for who is to complete it or when it is to be returned. When timelines and responsibilities have not been established through a clear statement of procedures, facts are either not completely provided or are not provided by all coordinators in a timely manner. Under these conditions, the processing of data to provide information is either delayed or does not even occur. In both instances information that could be very useful in program activity or planning is unavailable at the appropriate time. As a result of these problems, generally co-op directors appear to make decisions based on hunches influenced by a few isolated facts rather than make decisions based on a broad, total program perspective. Instead of using information systematically, they tend to set program direction and then hunt for information to justify that direction.

Steps in the Development of a Comprehensive Management Information System:

Several steps are involved in the process of developing a comprehensive information management and word processing system. Though we will be considering each separately, it is important

to keep in mind that in reality the entire process is highly interrelated.

A clear articulation of external expectations and program objectives:

Very often the program directors do not take the time to carefully consider and articulate clearly program goals and objectives. At the same time, they fail to carefully assess what others expect of their programs. Clear program objectives and a good understanding of what others expect are the necessary basis for information system development. Any data that is collected should provide information that is necessary to meet objectives and to measure objective accomplishment. It should also provide clear and timely information to involved and interested others including students, faculty, administration, community, state and federal officers. Sometimes it is difficult to assess the external influences upon a particular program or all the objectives of that same program. We have found that diagrams of forces impacting co-op and of the co-op process provide an effective starting point for clear articulation of both expectations and objectives.

A precise determination of information and data needs:

Once objectives and expectations have been clearly articulated, it becomes relatively easy to determine what information is necessary to respond to the questions of others and to meet or measure stated objectives. It is important here to make a distinction between information and data. Data refer to the individual facts

that are collected that either singly or more often in combination provide information necessary for program operation, In the process of identifying data for collection a few principles might be kept in mind.

In this process we move from information analysis to data identification. As a general rule, data for collection should be carefully selected to maximize the information that does become available.

At the same time information needs should be viewed comprehensively. If a staff takes a global view of all information requests, then subsequent data collection needs will probably be able to be reduced. At least, the repetitive collection of the same data pieces will be reduced. Also, a comprehensive approach will create a base of program data capable of generating still additional information when necessary.

Since both program objectives and information requests change from year to year, data types need to be reviewed periodically. In an organized information system, the changes that do occur in data collected will probably be relatively minor in relation to the total co-op data base. An annual time for such a review should be established. New data needs resulting from changed objectives and new information requests should be routinely recorded during the course of the year for processing at that established interval.

Institutions collect a significant amount of data on individual students and occasionally collect data on employers

working with the institution. It is important that a co-op program review the institutional data stored on students and employers, check their accuracy, and determine their availability for use by co-op staff. When such data are accurate and readily available, they can lessen the amount that the co-op program needs to collect.

Staff should concentrate on generating information essential to maintaining and evaluating the co-op program. This may well mean that they are unable to respond to every request for information about their co-op effort. An honest answer that certain information about a program is currently unavailable but may be collected in the coming year is generally satisfactory. Frequently, data that are collected can be reviewed to provide the answer to a new information request that occurs or to provide at least an inference about the question. This is why the ability to view data flexibly, i.e., cross-reference certain data items with other data items, is so critical.

Managing data and reporting information

Data management is extremely important to overall system functioning. A clearly articulated plan for data collection, storage and manipulation needs to be developed. A few guidelines are in order for each of these areas.

Data should be collected on well conceived and carefully designed forms. Collection instruments should be simple, clearly presented, and easily completed. Field testing is important before final collection formats are adopted. Whenever possible, data should only be collected once from the most accurate source.

In many instances the college student data base will be that source and for that reason the integration of the developed co-op base and the student record becomes especially critical. Finally, it is important to keep in mind that the methods used to store and process data will influence the design of collection instruments. For example, forms that are prepared for computer programs or input screens will simplify later data entry.

Directions about the storage and manipulation of data will be determined by both the information needs of a program and the resources available for storage and manipulation of data. As coordinators enter the arena of mainframes, mini- and micro-computers, on-line and batch systems, there is a need for expert support. College and university directors of computing services, as well as instructors in computer science, can be particularly helpful in providing a roadmap through the maze. Local resources need to be carefully explored. Very often the effort will reduce duplication and result in considerable savings later.

In summary, the selection of storage and processing techniques will depend upon the purposes of the system, the amount and the complexity of the data to be collected and the way information needs to be reported. Later, we will examine microcomputing equipment and software for its adequacy in meeting such requirements.

The manipulation of data is influenced by the desired final information output. Whenever possible, automated output should be designed for immediate reporting use. The information needs to be <u>clearly</u> and <u>succinctly</u> presented in a <u>standardized</u> format on a <u>regular</u> schedule. The regular receipients of reports should

be identified previously and, when appropriate and possible, reports should be tailored to individuals. Information reporting should be reviewed routinely to be sure that what is reported reflects an accurate picture of current program activity to the appropriate people. Understanding the potential for information processing and a well developed word processing capability are particularly important to this part of the system and need to be particularly well thought out and implemented.

Written procedures for data collection, storage, and manipulation are extremely important to system functioning. The system must identify where and how data will be provided and validated, where and how long it will be stored, how and when it will be manipulated, and to whom and in what format it will be reported.

Microcomputing implications:

We have moved very quickly through a process and built a Management Information System. We have defined objectives, specified information needs, identified data for collection, and established a systematic approach to data collection, storage, and manipulation. Finally, we have determined how and to whom information needs to be reported. Now it is important to explore the applications of microcomputing for system implementation.

In the selection of any software and hardware for system implementation, there are several points to keep in mind:

1) The selection of both hardware and software should be determined by available resources and established information needs. The selection of a computer will be influenced primarily by the

availability of appropriate software needed to store, manipulate, and report information. Systems can be computer driven but cannot be driven by the configuration and capacity of a particular computer and its available software. 2)The computer system that is selected should provide for management, information processing, and educational applications since all are critical to program operation. Because career orientation, resume development, even career search is important to student development, the educational applicatiions of the computing component need to be carefully reviewed. 3)Ideally, whatever computer component is chosen should be capable of integration with an institution's mainframe since much of the information necessary for cooperative education or career services is already found in the student data base. 4)Finally, the system chosen should be simple, user friendly, efficient and capable of being maintained.

Given these criteria there are several distinct advantages and some disadvantages to the use of microcomputing equipment. The advantages include: 1)Microcomputing companies today have relatively well developed software for file development, word processing, and are developing some career orientation materials. 2)Microcomputers can be used as terminals for access via modums to both institutional and external information sources expanding the availability of stored information beyond the micro itself. 3)Micros have developed and will continue to develop increased capacity for information storage and are increasing the speed of information retrieval. 4)It is possible to connect a series of microcomputing terminals together to network. This provides

the opportunity for a centralized information system in a program that is physically decentralized.

There are also some disadvantages to the use of micro-computing equipment. They include: 1)Some computers cannot load information from an institutional mainframe in a convenient manner. As a result, the system operator becomes responsible for all data entry and maintainance. In effect, the college maintains duplicate student records. 2)Though microcomputers can be networked, the capability of such a system is not nearly as well developed as that of a mainframe. 3)Though microcomputers now have relatively good software, available software will not always meet the exact needs of a particular program. This leaves the program director with programming needs similar to those if a mainframe were being used but without the added advantages of the mainframe.

In conclusion, microcomputers appear to be a real solution to the information management and word processing needs of many, but not all, programs. As the technology improves they should be an even more effective alternative. In every instance, advantages and disadvantages need to be carefully scrutinized and the decision about the choice of hardware and software needs to be made in relation to the program information needs.

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